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(54) Title: **GLUCANASES, NUCLEIC ACIDS ENCODING THEM AND METHODS FOR MAKING AND USING THEM**

(57) Abstract: The invention relates to polypeptides having glucanase, e.g., endoglucanase, mannanase, xylanase activity or a com-
bination of these activities, and polynucleotides encoding them. In one aspect, the glucanase activity is an endoglucanase activity
(e.g., endo-1,4-beta-D-glucan 4-glucano hydrolase activity) and comprises hydrolysis of 1,4-beta-D-glycosidic linkages in cellulose,
cellulose derivatives (e.g., carboxy methyl cellulose and hydroxy ethyl cellulose) lichenin, beta-1,4 bonds in mixed beta-1,3 glucans,
such as cereal beta-D-glucans or xyloglucans and other plant material containing cellulosic parts. In addition, methods of designing
new enzymes and methods of use thereof are also provided. In alternative aspects, the new glucanases e.g., endoglucanases, man-
nanases, xylanases have increased activity and stability at increased pH and temperature.